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AUTHOR Lock, Burt M.
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ABSTRACT

The lesson plans represent activities carried out in the industrial arts laboratory of Southside Junior High School as part of the Buffalo public school's career education project. Designed for the level of grade 10, these activities provide industrial arts instruction as a means to allow the student to gain awareness of his abilities, aptitudes, and interests through exploratory experiences related to industry and man's technological development. The content includes all elements of industry, occupations, materials, energy and power, processes, personnel, communications, services, and research and development. The central theme is the individual and his learning about himself through concepts and exploratory experiences. Each of the 37 lessons lists objectives, suggested time, needed materials and equipment, references, evaluation methods, and a summarizing statement. (Author/NJ)

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CAREER EXPLORATION ACTIVITIES

Southside Jr. High School
Buffalo, N.Y.

June 1975

by

Burt M. Lock, Teacher

For

Ronald Callahan, Southside Career Education Project Counselor

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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CE 006 264

PREFACE

CAREER EXPLORATION

Position: Industrial arts education has a dynamic, eminent role in career education. The programs, services, and activities must be of high quality, realistic in view of the world of work, flexible, meaningful, and suited to the needs, interests, and abilities of the students.

Goals:

1. To provide students the instruction needed to develop their self-awareness and self-direction; to expand their career concepts, awareness and aspirations; and to develop appropriate attitude about personal and social significances of career success.

2. To provide information and understanding that economics, technology, and social changes are causing the learner to anticipate the probability of change, to be flexible in learning new techniques and knowledge, and to be willing to adapt to change.

3. To provide information and guidance to allow each student to think objectively about career success in relation to their attitudes, training, and circumstances that surround their life.

Objective: To provide industrial arts instruction as a means to allow for exploration of experiences and in-depth identification of one's abilities, aptitudes, interests, and personality. Individual performance with tools, materials, and machines, together with thinking procedure should allow for insight needed to determine self-awareness relative to manipulative skills and thinking skills.

Content: Career exploration draws its content from exploratory experiences as related to industry and man's technological development. The content includes all elements of industry, occupations, materials, energy and power, processes, personnel, communications, services and research and development. The central theme of the content is the individual and his learning about himself through concepts and exploratory experiences.

Activities: The following lesson plans represent activities carried out in the industrial arts laboratory. It should be mentioned that these career exploration activities have been tried, reviewed, revised, and are still being used in an effort to teach career exploration. Through these activities the learner gathers insight and self-awareness relative to manipulative skills and thinking skills that should help to guide the tenth grader, whom this is designed for toward career success.

VT 102442

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Lesson Number 1
Career Exploration

LESSON PLAN

Activity: Field Trip to Southside Athletic Field

Time: 10 minutes Conditions: Weather: warm - near school

Objectives: 1. To observe construction
2. Look at work through occupational awareness
3. To observe progress of work

Reference: Job construction of athletic field and track

Materials & Equipment: Career World - Construction Jobs

Equipment: Back Hoe, Surveying, Dump Trucks, Drain Tiles, Asphalt Roller, Asphalt Spreader, Bulldozer (D-4) with 8' Blade, Bulldozer with Front Load Bucket

Personnel: Surveyor, Rod Man, Chain Man, Foreman, Truck Drivers, Operating Engineers, Laborers.

Additional Visits: To observe work procedures, progress, and damage done by a stolen car.

Self-Awareness: Each student should consider the possibilities in the construction industry and the out-of-doors working conditions.

Evaluation (concepts): Work attitudes, the opportunities, values for male and female workers, unions and analyzing.

Summary: The student should look upon all construction sites to observe jobs, equipment and their own awareness.

Lesson Number 2
Career Exploration

LESSON PLAN

Activity: Measuring (Fractional Inch)

Time: 50 minutes Conditions: 5, ten minute lessons

Objectives: 1. To familiarize students with measuring

2. To restore confidence in the fractional inch

3. Provide work experiences to utilize measuring

Reference: Work on a project for one week (measure to 1/16")

Materials and Equipment:

Rulers (fractional)
Electric measuring board
Project material
Lathe (decimal inch)
Measuring Exercise Sheets
General metals textbook - page 46
Measuring Paper
Measuring Lessons 1-5
Measuring Charts
Measuring Quiz (evaluation)

Self-Awareness: Understanding measuring, use measuring to complete a project.

Evaluation (concepts): Accuracy, reducing to lowest terms, and usefullness of measuring.

Summary: Students should be able to measure before, sawing, drilling, and lathe operations.

Lesson Number 3
Career Exploration

Lesson Plan

Activity: Career Maturity Inventory

Time: 15 minutes Conditions: First week of school (and last)

Objectives: 1. To determine each student's career awareness

2. To establish a rank in class

3. To evaluate career awareness growth

Reference: Career Maturity Inventory (mimeographed)

Materials & Equipment: Career Maturity Inventory I (first week)
Career Maturity Inventory II (last week)
Pencils

1. Inventory given without any discussion
2. After corrected they are returned for discussion and recollected
3. The last week the career maturity inventory is re-administered
4. Difference between first and second. +3points for each improvement or 30 points for perfect paper minus 1 for each missed.

Self-Awareness: Students become more aware of their opinions toward careers - stress on reality.

Evaluation (concepts): Students with high scores are awarded with points as are those with attitude improvements.

Summary: This has been used before and proved very gratifying in measuring student improvement.

Lesson Number 4
Career Exploration

LESSON PLAN

Activity: Space Age Technology

Time: 2 weeks Conditions: Warm months (Sept., Oct., May & June)

Objectives: 1. To provide fundamentals of flight

2. Establish relations between rockets and jets

3. Promote interest and swareness in transportation

Reference: Estes Industries and Model Rocketry

Materials & Equipment: A. 7 ditto sheets on space age technology
Bernoulli's principle
Theory of flight
Air foil section
Force = Mass X Acceleration
History of Rockets and Jets
Flight controls
Rocket safety
Newton laws of motion

B. 3 page quiz on the above

C. Model rockets, launch pad, electric ignition altiscope, rocket engines, and recovery equipment

D. Cut away model of a jet engine and a rocket engine.

E. Notes on chalk board, plus various demonstration. Equipment: model rockets, model planes, wind tunnel, air foil cross section, etc.

Self-Awareness: To understand model airplanes and rocketry in revelation to modern transportation.

Evaluation (concepts): Build rockets, flight theory, power sources, tracking and recovery, safety and craftsmanship.

Summary: Offer two weeks of short lessons and notes, while building model rockets, testing, and launching.

LESSON PLAN

Activity: Rope Trick Project

Time: 2 weeks **Conditions:** First Project - Student needs instruction

Objectives:
1. To build a Project and learn thinking techniques
2. Students become familiar and use several machines
3. Apply measuring and safety

Materials & Equipment:
Red oak flooring 3/16" X 3" X 8"
2 wood turnings (painted)
36" of plastic clothesline
3/4 drill + 1/4" drill
Plane
Ruler
Try square
Files
Varnish
Large teaching model
Ball peen hammer
Letter stamps
Anvil

Self-Awareness: Ability to build a project using several machines and hand tools, establish work attitude and habits

Evaluation (concepts): Procedural thinking, analytical thinking, problem solving, safety, craftsmanship, and machine.

Summary: Upon completion of the rope trick project, each student learns to make it work and a contest, review purpose of project.

LESSON PLAN

Activity: Belt Balance

Time: 3 days Conditions: Beginning Project

Objectives: 1. To allow students to begin working on a project the first week of school.

2. Relate safety, concepts, quality, and measuring, demonstrate a completed project.

Materials & Equipment:
Band iron 1/16" X 1/2" X 4"
Letter stamps
Ball peen hammer
Ruler
Scratch awl
Vise
Forming (slip) rolls
Gas furnace
Tongs
Gloves
Files
Abrasive Cloth
Motor Oil
Steel wool

Self-Awareness: Ability to reform simple laboratory tasks and create a project from materials.

Evaluation (concepts): Safety, quality, concentration of weight, center of balance, torque, and balance point.

Summary: After completing the band iron belt balance it is reviewed to emphasize the concepts learned.

LESSON PLAN

Activity: Small Engine Repair and Operation

Time: 1 week Conditions: Warm weather

Objectives: 1. Learn theory of internal combustion

2. To learn how tools are used and engine parts

3. Each student become able to disassemble and re-assemble an engine

Reference: Cut-away of one cylinder engine

Materials and Equipment: Tools (sockets, wrenches, torque, etc.)
Cut-away engine
Display of engine parts
Exploring Power textbook
Small engine repair manuals
12 old one cylinder engines
3 operational 1 cylinder engines
Transparencies of two and four cycle engines
Special tools (ring compressor, valve spr. comp)
Spark plugs
Feeler gage
Gasoline and oil
Neon tester to demonstrate induction
Carburator to demonstrate Bernoulli's principle

Self-Awareness: Ability to handle tools, take engines apart and re-assemble. The need for everyone to understand engines.

Evaluation (concepts): Safety using the proper tool, precision parts, interchangability, theory of int. comb.

Summary: Each student will be able to replace engine parts, operate and service small engines.

LESSON PLAN

Activity: Aluminum Name Tag and Bracelets

Time: 3 days Conditions: A fill in (short time) activity

Objectives: 1. To use a drill press and hand tools

2. To make an identifying name tag or bracelet (worn by many - name learning method)

Reference: Sample Name Tag "your name"

Materials and Equipment:
Squaring sheer
Ruler
Pencil
Aluminum 18 gage - 1" X 6"
Drill press
Steel wool grade 0-0
Metal hole punch
1" 16 brass estucheon pins
Anvil (bench)
Ball peen hammer
1/4" Letter stamps
1/4" Figure stamps
Bracelet bender
Abrasive cloth

Note: Many other activities with aluminum may be used such as: coasters, coin dishes, jewelry and boxes.

Self-Awareness: Operation of the drill press as related to machine operation occupations in factories.

Evaluation (concepts): Craftsmanship, safe machine operation, engine finish, embossing, conservation of materials.

Summary: The students are given the option of a name tag with nails, or a bracelet. Usually want to make more than one.

Lesson Number 9
Career Exploration

LESSON PLAN

Activity: Creative Invention

Time: A semester Conditions: To be done outside of school

Objectives: 1. To allow for creativeness

2. Emphasize problem solving techniques

3. To show how simple inventions are made

Reference: Display of inventions

Materials and Equipment:
1. Invention articles: John R. Waste-wastebasket
Problem solving
Flying a kite over Niagara Gorge
Building destruction shock absorber
(tire) on cable to "head ache ball"
2. Charts - Problem solving
3. Display of inventions and handout sheet "creativity"
4. Notes on problem solving techniques
5. Copyright documents
6. Display articles copyrighted
7. Leonardo DiVinci's notes and drawings
8. Display student creative inventions
9. Discuss with parents (at open house) the need for creative expression and learning problem solving techniques
10. Demonstrate inventions in Popular Mechanics, etc.

Self-Awareness: Every individual has some ability to be creative

Evaluation (concepts): Problem solving, creative invention, everyone has a right to be inventive. Inventors.

Summary: All work is done outside of school and full credit is given for every completed project

Lesson Number 10
Career Exploration

LESSON PLAN

Activity: Elections

Time: 1 day/5 weeks Conditions: Need established for leadership

Objectives: 1. Teach democratic principles

2. Establish a pupil personnel organization

3. To allow for distribution of leadership responsibility

Reference: The Democratic (2 party) system

Materials and Equipment:
1. Ballot Box
2. Ballots
3. Leadership responsibilities, job descriptions
4. [illegible]ly sheets
5. [illegible]matic voting machine
6. Clean-up grading sheets
7. Pupil Personnel sheet
8. Voting Facsimilie
9. Voting Signs
10. Petitions
11. Tape recorder or CL/TV
12. Computer cards for demonstrating voting in the future

Clean-up Activity - Responsibility

Note: The elected leaders (superintendent and foreman) appoint area foreman such as tools, automotive, power mechanics, metals, electricity, and printing.

Self-Awareness: Opportunities in the Political and Business world. Ability to provide leadership role playing.

Evaluation (concepts): Democracy leadership, responsibility, organization, secret ballots, winning and losing.

Summary: Four elections a term, one primary day and one election day every five weeks

Lesson Number 11
Career Exploration

LESSON PLAN

Activity: Field Trip - on the job with a parent

Time: 1 day Conditions: Excused from school (with verification)

Objectives: To increase self-awareness by providing insight into skills

Put entails and abilities which relate to the world of work

Reference: Southside C.E.P. Letter to parents

Material and Equipment:
1. Letter to parents explaining procedure and purpose of on the job observation
2. Permission slip (to be verified)
3. Two field trip questionnaires

10th grade homework assignment - 10 points
"Research any occupation and write a one page report attach your question and answer sheets to your report. You may read (occupational outlook handbook), interview, or visit some one in any job, occupation, or career. In your report indicate how your personal traits would determine success or failure in this occupation".

Self-Awareness: Insight into skills, potentials, abilities, and interests.

Evaluation (concepts): Punctuality, attendance, work values, dollar earnings, unions, opportunities, advancement, etc.

Summary: A written report indicating personal traits and how they would affect success or failure on the job observed.

Lesson Number 12
Career Exploration

LESSON PLAN

Activity: Self-Awareness - Self-Evaluating

Time: 10 minutes to 2 hours Conditions: Readiness must be established

Objectives: To become aware of one's self, in relation to careers

Reference: Self-directed search/self-evaluation/personality check list

Materials and Equipment: Usually done outside of class

This instrument used to help the individual are usually used by all careers sections. A few have adaptation and utility in career exploration.

The central theme in career exploration is activities. However, "the self directed search", "self evaluation form" and the "personality check list" have been given as outside assignments.

When given the choice the student seems to prefer activity (working on a project) as opposed to written work. It is judged that experiments, projects, and meaningful activities are more rewarding to the student in the self-awareness search. A few of the outside assignments do blend in well with activities.

Self-Awareness: The self-directed search is completed by the student at home, and reviewed with the teacher.

Evaluation (concepts): Self-awareness, involvement, and understanding is career education.

Summary: A few of these methods have merit in career exploration.

LESSON PLAN

Activity: Measuring Speed

Time: 30 minutes **Conditions:** Warm weather

Objectives: 1. To learn a formula for determining M.P.H.

2. Find a method of estimating time and distance

3. Understand conversion of ft./sec. to M.P.H.

Reference: Physics Textbook

Material and Equipment:
1. Stop watch
2. 100 ft. tape
3. Clipboard
4. Chalkboard
5. Mini-bike or bicycle
6. Wind meter (Bernoulli's principle)
7. Wrist watch

Formula: $R = D/T$

R = Rate

D = Distance Result ft./sec.

T = Time

Conversion of feet per second to M.P.H. at 60 M.P.H.

$$\frac{60 \text{ sec.}}{80 \text{ ft.}} \left(\begin{array}{l} 60 \text{ sec.} \\ 1 \text{ mile} \end{array} \right. = \frac{30}{44} \text{ ft./sec.} \times 3/4 = \text{M.P.H.}$$

Self-Awareness: Ability to utilize/mathematical formulas to figure velocity and speed in M.P.H.

Evaluation (concepts): Measurement, estimating distance by pace and seconds by counting, converting ft./sec. to M.P.H.

Summary: Most students are able to relate to computing speed and developing thinking exercise skills.

LESSON PLAN

Activity: Career and Technology Scrapbook

Time: 8 weeks Conditions: Outside of class

Objectives: 1. To develop interest in reading the newspaper and search for articles about careers and technology.

Reference: Examples of past scrapbooks

Material and Equipment:

This is an extra credit assignment!!!!

1. Keep all of your papers, tests, quizes, and notes in a notebook or folder.

2. Add any interesting newspaper articles about anything we have or will be studying. Paste the article or picture to a piece of $8\frac{1}{2}$ X 11" piece of paper. Underline the main points of the article and submit these with your papers.

Examples: articles on - careers - labor force
- values - industry
- technology - safety, etc.

Self-Awareness: Students become aware of their occupational interest and variety of experiences in career exploration.

Evaluation (concepts): Reading, searching for relevant materials, organization, responsibility, current events.

Summary: Students are slow to start, but it seems to become habit forming and rewarding.

LESSON PLAN

Activity: Ethnic Group Studies

Time: 3 days Conditions: Black History Week or appropriate time

Objectives:

1. To improve self-image of all youngsters
2. To improve self-esteem of minority groups
3. Teach facts not prejudice

Reference: Afro-American Inventor Display

Material and Equipment:

Efforts have been made to improve the self-esteem of black children and spanish americans. These efforts include selecting students to do research, gather information and assemble displays. These efforts have merit and have undoubtedly helped. On the other hand, caution must be taken not to encourage it to such an extreme that it becomes racist, nor should it be so shallow that it stresses a few "acceptable" heros. Children and society will not be served by either approach.

Last year the afro-american inventors, portfolio and display was completed. This year several students are working on contributions by spanish-american, polish-american, irish american, german-americans, and native americans.

Self-Awareness: An individual's behavior (attitude) is frequently determined by the perceptions he has of himself and the world around him.

Evaluation (concepts): Minority group career contributions to American science, technology and business, inventors.

Summary: One of the clearest differences between black children and white children is that society continually tells each group that it is different.

Lesson Number 16
Career Exploration

LESSON PLAN

Activity: Study of Hand Tools

Time: 2 weeks Conditions: Assuming no tool instruction

Objectives: 1. To learn that each tool has a specific purpose

2. Identify tools by name and use

3. That tools are needed to assemble even the most complicated equipment, such as: computers, lasers, etc.

Material and Equipment: Methods of Teaching Hand Tools

1. Tools display
2. Study of tool panel before class
3. Film: ABC of hand tools
4. Take home for study - ABC of hand tools booklet
5. Tools in textbooks (general metalist and exploring power)
6. Tools game (teams, trades, scoring according to sport season)
7. "NASA" catalogs of tools
8. Tools notes
9. Tools for making a hockey stick, or goal post
10. 10 tools quiz or ABC hand tool quiz
11. Use of tools in project (review each project)
12. Local tools manufacturers
13. Film "Tool Power" JH Williams Co.
14. Tool Projects: screwdriver, scriber, hammer, hike tire irons
15. Display newspaper tool advertisements
16. Tools crossword puzzle

Self-Awareness: Any occupation from secretary to mechnic should be able to identify and use tools properly.

Evaluation (concepts): Tool identification, safe use, limitations, organization and maintenance.

Summary: There is inherent activity with hand tools and becoming familiar with them will be an asset to any career.

Lesson Number 17
Career Exploration

LESSON PLAN

Activity: Foundry

Time: 3 days Conditions: No previous casting experience

Objectives: 1. To recognize products that as cast

2. To complete the casting procedure

3. Understand the career possibilities in foundry

Reference: General Metals Textbook

Material and Equipment:

Foundry equipment
Zamak
Foundry file - patterns, molds, articks
textbook
Foundry quiz
"tote board"
Grinder (moto-tool)
"U.S. map coin dish"
Steel wool
Letter stamps
Ball peen hammer
Gas furnace
Gloves
Glasses

Self-Awareness: Students are able to learn about foundry and successfully cast a simple pattern - project.

Evaluation (concepts): Safety, melting temperatures, quality, casting procedures, career possibilities.

Summary: A very rewarding activity in that each student can reproduce an object with molten metal.

Lesson Number 18
Career Exploration

LESSON PLAN

Activity: Small Duck Wall Plaque

Time: 3 weeks Conditions: Limited wood and metal experience

Objectives: 1. To learn use of the drill press, band saw and assorted hand tools

2. Apply manual dexterity in a project

Reference: Sample small duck project

Material and Equipment: Red wood 3/8" X 3½" X 12" (body)
Alumimum (wings) 26 gage 3½" X 6"
Brass estucheon pins 1" X 16
Band saw
Coping saw
Scratch awl
Ball peen hammer
Ruler
Steelwool
File
Sand paper
Varnish
Brass hanger 20 gage 1" X 2"
Metal hole punch
Alumimum neck band 26 gage 3/8" X 4"
Letter stamps

Self-Awareness: Manual dexterity, safety, craftsmanship, handling of small parts, operating machines.

Evaluation (concepts): The individual becomes aware of their manipulative (hand-eye) skills.

Summary: A time consuming but quality, decorative project. Usually voted upon among others as a choice.

Lesson Number 19
Career Exploration

LESSON PLAN

Activity: Screwdriver Project

Time: 2 weeks Conditions: Limited metal exploratory experience

Objectives: 1. To learn about the lathe, forge, heat treating
2. To develop manipulative awareness and skills
3. To make a useful project

Reference: Screwdriver parts display

Material and Equipment: Power hack-saw - 1.5 cm.X 8 cm.
Lathe - face turn (alumimum)
Taper turn to 3.5 cm.
Center drill and boring
Knurling
Forge - tool steel 3/16" X 6 cm.
Initial stamp in "vee block" (1/8")
File to screwdriver shape
Heat treat - anneal
harden
temper
Arbor Press- Force fit
Magnetize and plastic tip
Equipment - metric layout
hardness tester (Rockwell)
old hack saw blades
Lathe - forge - heat treating
molecular lattice - face centered
body centered

Self-Awareness: Ability to produce a difficult project and operate difficult machinery using metric measurement.

Evaluation (concepts): Safety, magnetism, molecular structure, heat treating, forging, lathe operation, metric measuring.

Summary: A time consuming activity. Difficult but excellent result in project and experiences.

LESSON PLAN

Activity: J-E - Electronic Experiments

Time: 2 weeks **Conditions:** End of semester - groups of three

Objectives: 1. These experiments will show some of the electrical phenomena and electrical devices which are a vital part of electrical technology.

Reference: Experiences with Electronics - text book

Material and Equipment: J-E Electronic Experiment Kit

Experiments that may be done individually or in small groups.

Experiments	Additional Experiments
1. Generation of electromotive force	1. Moisture detector
2. Control of current	2. Temperature meter
3. Series of parallel circuits	3. Sound meter
4. Ohm's law circuit	4. Transistor radio receiver
5. The voltmeter	5. Transistor radio
6. The ammeter	6. Code practice oscillator
7. The public address system	7. Audio telegraph system
8. Radio receiver	8. Telephone system
9. House wiring circuits	9. Sound by light beam
10. Photocell relay	10. Telemetry
11. Sound relay	11. Transistor relay
12. Fire alarm system	12. Fire alarm w/audible signal

Each experiment
A. Summary of text material
B. Materials needed
C. Procedure and summary

Self-Awareness: Electricity - electronics understanding as needed in many jobs, skilled work, career opportunities

Evaluation (concepts): Electron theory, safety, wiring, circuits, summary of reading, following procedures (schematics).

Summary: Each experiment is written up so that they may be worked by individuals, small groups, or the entire class.

LESSON PLAN

Activity: Films and Filmstrips

Time: 4 days Conditions: Each must have readiness

Objectives: 1. To show relevance for making decisions
2. Establish value awareness
3. Indicate self-awareness and work success

Reference: Southside C.E.P.

Materials and Equipment: 16 mm. projector - filmstrip projector - tape cassette

"Roles and Goals" - 10 minutes - establish readiness by students examining their goals (goals - pleasure).

"Bob-Caren-Ted and Janice" - 30 minutes - excellent shows individual problems - refer to ditto sheet for readiness and review.

"Making it in the World of Work" - 30 minutes - eleven individual attitudes towards careers and life. Refer to ditto sheet for readiness and review.

Self-Awareness: Students think about values and careers. Establish individual attitudes toward work.

Evaluation (concepts): Value awareness, career awareness, the realistic world of work, basic attitudes.

Summary: Each of these films are used as supplemental information to exploratory career experiences in the lab.

LESSON PLAN

Activity: Self-Discipline

Time: Entire semester

Conditions: Exploring power workbook ($\frac{1}{2}$ completed in class)

Objectives: 1. To allow students to understand self-discipline

2. Provide opportunities for self-discipline

Reference: Def: Doing something one doesn't necessarily want to do to completion.

Material and Equipment: Exploring Power: Workbook and Textbook

Reading is an important skill in many careers and may be the deciding factor in job advancement in others.

To improve reading skills the learner is encouraged to practice self-discipline as a means to achieve goals.

The Exploring Power Workbook is started in class. Each student progresses at their own rate according to ability and interest until the workbooks are over halfway completed.

The remainder of the workbook may be completed at home using the accompanying textbook for 10% extra credit. Every student has this opportunity, many will demonstrate their self-discipline by completing the assignment.

Self-Awareness: Self-discipline as a means for achievement toward an individual's goal.

Evaluation (concepts): Reading, investigation, fact finding, self-discipline, goals, achievement.

Summary: This is a difficult assignment and relates to the activity of small engine repair and operation.

Lesson Number 23
Career Exploration

LESSON PLAN

Activity: Extra Credit

Time: Several weeks Conditions: To be done outside of class

Objectives: 1. To allow for misjudgement in grading
2. To provide opportunities for excellence
3. To establish self-discipline skills

Reference: Hand out sheets "Homework Assignments" "Extra Credit"

Material and Equipment:

1. Careers scrapbook
2. Values scrapbook
3. Model building (interdisciplinary ed.)
4. Creative invention
5. Occupational research
6. Job interview
7. On the job observation
8. Book report on careers
9. Exploring Power Workbook
10. Make something for someone
11. Research ethnic group inventions
12. Three career reports (Occ. Outlook Handbook)
13. Self-Directed Search
14. Self-Evaluation - Personality Checklist
15. Optional final examination
16. Reading Popular Mechanics Magazine

Self-Awareness: Grade achievement, excellence in education, self-discipline, reading, reporting.

Evaluation: A worthwhile opportunity for most students to express self-discipline.

Summary:

Lesson Number 23
Career Exploration

LESSON PLAN

Activity: Candle Holder

Time: 1 week Conditions: Christmas Time

Objectives: 1. Make a decorative candle holder that the maker will be proud of.

2. Demonstrate manipulative skills

Reference: Four tupes of candle holders

Material and Equipment: Types 1. Swedish Candle Holder
2. Wooden Base Candle Holder
3. Wrought Iron Candle Holder
4. Authentic Candle Holder

Students select the candle holder they want to make.

Example - wrought iron

1. Brass table leg ferrule, brass
20 gauge 3" X 3"
nut and bolt 3/10" X 1/2"

2. Band iron 1/8" X 1/2" X 6"
Di-arco bender
Drill press (3/16" drill)
Files
Ball peen and plastic tip hammer
Black spray and clear lacquer

Self-Awareness: Making a useful, decorative object, self-esteem, manipulative skills.

Evaluation (concepts): Safety, pride, finishing, peening, banding, drilling assembly.

Summary: This project - activity is only relevant at Christmas time.

Lesson Number 25
Career Exploration

LESSON PLAN

Activity: Napkin Holder

Time: 1 week Conditions: Anytime - Spring is preferred

Objectives: 1. Assemble a project with preformed pieces

2. Make a project for family utility

Reference: Sample napkin holder (cape cod design)

Material and Equipment: Old coping saw, frames for handle
wooden base (size of napkin)
2 - 3/4" X 6 brass R.H. screw
Stain
Varnish
Spray enamel, black and gold
Plastic hold - down 1/4" X 2" X 8"
Band saw
Black lacquer
File
Sand paper
Ruler
Scratch awl
Letter stamps
Ball peen hammer
Paper napkins

Self-Awareness: Development on manipulative skills, assembly awareness.

Evaluation (concepts): Safety, hand saw operation, finishing: lacquer, spray enamel, stain, varnish.

Summary: A good project that may be varied according to available materials and machines.

LESSON PLAN

Activity: "Old Ironsides" Navel Cannon

Time: 2 weeks **Conditions:** Previous wood and lathe experience

Objectives: 1. To allow students to become involved in complicated lathe procedures.

2. Exploratory experiences in model building.

Material and Equipment:

Cannon Carriage	Cannon Barrel
Patterns	Alumimum 5/8" dia. X 4"
Wood 3/8" X 2;/4" X 12"	Lathe: Ball turning
Drill press	Taper turning
Band saw	Center Drill
Coping saw	Boring 3/8" X 1"
Brass estucheon pins 1" X 16	Filing
Stain	Cut off
Files	Automatic feed
Varnish	Drill press
Brass - 20 gauge 1/4" X 2"	power hack saw
Brass rod 1/8" dia.X 4"	Letter stamps
Letter stamps	"Vee Block"
Sand paper	Ball peen hammer
Brass washers no. 4	Vise

Note: Complicated lathe work is a good indicator to the individual of their manual thinking skills, for career abilities.

Self-Awareness: Historical events, duplicating models of originals, following blue prints, machine careers.

Evaluation (concepts): Safety, lathe, power hack saw, drillpress and grinder operation, firing firecrackers danger ($1\frac{1}{2}$').

Summary: A lengthy project, many lathe operations, a quality model for nick-nack, paper weight, desk, etc.

Lesson Number 27
Career Exploration

LESSON PLAN

Activity: Casting Lead Sinkers

Time: [illegible]utes Conditions: Readiness with study of lead

Objectives: 1. To create a line production
2. Teach danger of lead poisoning
3. Introduce time, study, quality controlm competition

Reference: Lead finishing sinkers ½ oz. up

Material and Equipment: Gas furnace
Ladle
Lead ingots
Permanent molds (alumimum)
Gloves
Stop watch
Aviation snips
Scratch awls
Files
Poisonous metals display
"tote board"
Splash bucket
Cart

1. Time study
2. Competition between classes
3. Quality control
4. Distribute 3 each

Self-Awareness: Dangers in casting and storing, mass production work, competition, career possibilities.

Evaluation (concepts): Line production, quality control, time study, market analysis, safety, permanent mold.

Summary: A fast one day exploratory experience which is a relevant activity.

Lesson Number 28
Career Exploration

LESSON PLAN

Activity: Dust Pan Project

Time: 2 weeks Conditions: May be a beginning experience

Objectives: 1. To introduce bench tools and hand machines
2. Relate industrial processes to the student
3. Following of plans, procedures and directions

Reference: Completed dust pan

Material and Equipment:

Tin plate - 30 gauge
Tin snips
Aviation snips
notcher
Pattern
Scratch Awl
Metal Hole Punch
Dividers
Spot Welder (2 cycle automatic)
Gas furnace
Gloves
File
Solder
Soldering copper
Salammoniac
vibro engraver
Bar folder
Bending brake
Slip rolls
Vise
Squaring sheer
Rivet 1/8" tinners
Rivet set
Stake (square)
Stop welder (manual)
Template 13/4"

Self-Awareness: Career possibilities, various individual construction steps, safety work habits.

Evaluation (concepts): Sheet metal forming, resistance (spot), welding, soldering fussion, lay out, hand machines.

Summary:

LESSON PLAN

Activity: Model Building

Time: Term Conditions: Some Laboratory Experience

Objectives: 1. To allow students to make models from kits, from drawings, from pictures or original design.

Reference: Model Display

Material and Equipment:

Homework assignment - build a model of anything that represents a technological improvement. It may be assembly of a kit such as a turbine, wankle of V-8 engine, rocket, plane, ship, or car. Drawings and pictures may be used to build a model of any industrial complex of part thereof. Interdisciplinary study such as building a model to demonstrate social studies, science, or language is encouraged.

All materials and work is to be completed outside of the regular scheduled laboratory periods.

This should be an exploratory experience, adding to their knowledge of construction.

Self-Awareness: Ability to build models, model building as a career possibility, originality, and improvising.

Evaluation (concepts): Model representations, scale, depicting the original, need for models.

Summary: A new exploratory experience that requires a lot of time working outside of class.

LESSON PLAN

Activity: Printing - Graphic Communication

Time: 2 weeks **Conditions:** Fundamentals of Printing

Objectives:
1. To introduce offset printing
2. To introduce letter press printing
3. Career possibilities in graphic arts

Reference: Printing display - Printing Textbook

Material and Equipment:

Letter Press

Christmas card (2 color)
(during the season)
"I.O.U." - To teach records
"Just for Today" - Thoughts on behavior
"Tickets" or I.D." cards - numerical
"Chill factor table" - winter
Rubber stamp - names
Gold leaf stamping
Film "Graphic Communication : They used to call it printing"
Hermes Engraver - name tags in plastic

Offset

Carpenter
"Lincoln"
"Carelessness"
"Birthday card"

Self-Awareness: Career possibilities, operating a printing press, manual dexterity of type setting.

Evaluation (concepts): Offset lithography, letter press, newspaper printing, flexography, duplication, industry.

Summary: Time consuming, difficult to have every student set-type. Tupe "locked up" run in pilot press 1-5.

LESSON PLAN

Activity: Optional Final Examination

Time: Until final Conditions: Two months of book work

Objectives: 1. To allow fast students the option of taking the final examination at home with two textbooks and classnotes.

Reference: Samples of previous take home finals.

Material and Equipment:

1. Use of Occupational Outlook Handbook (one copy per student)
2. Interview someone unemployed
3. Interview someone employed
4. Refer to your self-directed search

Assignment (30% of final report card mark)

1. Research three (3) careers and write a one page report on each. One of these must have the same code as concluded in your self-directed search.

2. Interview someone unemployed and someone employed and write a one page report.

3. Submit the three careers and employed and unemployed with your self-directed search before the date of the final

Self-Awareness:

Evaluation (concepts): Research, reading, writing, self-awareness, interview.

Summary: A difficult assignment - the regular final examination is a formula comparing career maturity inventory I & II.

LESSON PLAN

Activity: Memo Pad Holder

Time: 3 days Conditions: Establish a line production

Objectives: 1. To learn about mass production
2. To study quality control, time study and market needs
3. To involve everyone in a worker-management situation

Reference: Memo Pad Holder

Material and Equipment:

24 gauge galvanized steel 4" X 10"
Bar folder
Bending brake
Metal Hole Punch
Scratch awl
Metal squaring shear
File
Steel wool
Dymo tape writer 3/8"
3/16" X 1/2" nuts and bolts
"Memo" printed 3" X 5" paper
"Strike and stations" signs

Assembly Line Stations

1. Layout	4. Filing	7. Quality Control
2. Punching	5. Bending	8. Assembly
3. Forming	6. Cleaning	9. Testing

A. 5 leaders become management - others work force
B. Union leader assigns personnel to jobs
C. A strike is called for contract violation
D. Review line production, and its career significance

Self-Awareness: Boredom of line production, career awareness

Evaluation (concepts):

Summary: This line production should run itself. It is interesting to use a CCTV and then stop the line to allow workers to evaluate line efficiency.

Lesson Number 33
Career Exploration

LESSON PLAN

Activity: Study of Metals

Time: 2 weeks Conditions: Working on Metal Projects

Objectives:
1. To identify metals
2. To be aware of their uses
3. Identify metals: ferrous, non-ferrous and alloys

Reference: Metals Methods

Material and Equipment:
1. Metals display before class
2. Films: lead, aluminum, zinc, copper, steel
3. Metals values (adapted from "moon shot")
4. Hand out sheets "intro. to metals", "alloys"
5. Special metals display
6. General metals textbook, Al., Fe., Cu., etc.
7. "Metallurty and wheels" sign out booklet
8. Metals Game by symbol (periodic element table)
9. Identify metals game
10. Analyze objects, chairs, sink machines, cabinets, etc.
11. Contact with metal morning until night
12. Displays "metals", "properties", fasteners", "coatings"
13. Review metals used in projects
14. Transparencies "Metalwork"
15. Poisonous metals display, lead, mercury, cadmium
16. Homework - Properties
17. Metal flash cards and notes
18. Metals quiz show
19. Microscope - Look at grain structure
20. Distribute bronze pennies ("penny copper")

Evaluation (concepts): Metal identification, ferrous, alloys, molecular structure, cladding, fussing, fastening.

Summary: Activities are usually the projects, however, many metal teaching methods include activities.

Lesson Number 34
Career Exploration

LESSON PLAN

Activity: Energy

Time: 1 week Conditions: Best during winter months

Objectives: 1. To teach conservation of energy
2. Knowledge of energy sources
3. Future predictions

Reference: Energy File

Material and Equipment:
1. Piezeoelectric demonstrator (elec. by pressure)
2. Cut away - 4 cycle engine (elec. by induction)
3. Steam engine (generation)
4. Hand out sheets: energy sources
nuclear option
world oil production
5. Nuclear power plant model
6. Less use of gas furnace
7. Term paper on energy consumption
8. Energy home check list
9. Less use of gas furnace
10. Models of energy production

Self-Awareness: Career possibilities in the field of energy.

Evaluation (concepts): Conservation of materials and energy

Summary: This has relevance before an energy crisis. Many activities related to energy.

Lesson Number 35
Career Exploration

LESSON PLAN

Activity: Copper Projects

Time: 3 days Conditions: After working with alumimum

Objectives: 1. To learn usus of copper
2. Understand scarcity
3. Develop a copper name tag

Reference: Sample of "Your Name" tag

Material and Equipment:

Copper - 24 gauge 1" X 6"
Tin snips
File
Steel wool
Letter stamps 1/4"
Ball peen hammer
Bench anvil
Drill press
Liver of sulphur
Metal hold punch 1/8" punch and dies
Dies and arbor press

Project #1 - Name tag with engine finish, dipped in liver of sulphur solution, lacquered to retain colors

Project #2 - Coasters, formed with dies, machine finished, colored and lacquered.

Self-Awareness: Manipulative skills, jewelry making, career possibilities in bench work.

Evaluation (concepts): Safety, coloring, engine finish, drawing with dies, conservation, skill.

Summary: After learning techniques on alumimum, copper is used, expensive material.

LESSON PLAN

Activity: Mock Court Trial

Time: 1 period Conditions: Minor discipline violation

Objectives:
1. To give students an opportunity to participate in a court proceeding
2. Understand the judicial system

Reference: Previous trials, current trials in the news

Material and Equipment: Role Playing

1. Identify the defendant (defendant)
2. Prosecutor (plaintiff)
3. Judge
4. Bailiff (sgt. at arms)
5. Defense Attorney
6. Witnesses
7. Jury
8. Clerk

Procedure

1. Hold a pre-trial hearing - enter plea
2. Indictment by prosecutor
3. Witnesses
4. Lawyers cross examine and summarize
5. Jury is charged by judge
6. Foreman present jury's findings
7. Judge sentences (under teachers guidance)

Self-Awareness: Predicament of all persons involved, career awareness, value awareness, laws.

Evaluation (concepts): Values, careers, procedures, predicaments, court terminology, role playing.

Summary: This has to be guided by the teacher, without too much interference.

Lesson Number 37
Career Exploration

LESSON PLAN

Activity: Course Evaluation

Time: 15 minutes Conditions: After each marking period

Objectives:
1. To give students an opportunity to participate in teacher - pupil planning
2. Give students a review of course objectives
3. Allow for students input relative to likes and dislikes
4. To make the course relevant.

Material and Equipment:

1. After report cards are marked, pass out hand out sheets with 20 course methods and objectives.
2. Have students respond in secret and add comments for things that are bothering them.
3. Tabulate results by class, and then by all classes, this takes about 4 hours. Students can help in tabulating.
4. Presents the results of the course evaluation (results, Nov. 1974)
   more career awareness
   more educational films
   more group projects
   less reading
   more exploratory experiences
   more experiments

Evaluation (concepts): Teacher, pupil planning, tabulating, flexibility, course objectives, student relevance.

Summary: This is a device for getting feedback before the term ends so adjustments may be made.